<u>**Amendments to the Claims**</u>:

The following listing of claims will replace all prior versions and listings of claims in the application:

<u>Listing of Claims</u>:

1. (Currently Amended) An iterative decoding and equalizing device for high bit rate communication over frequency-selective channels with multiple transmit and receive antennas, said device comprising a decision feedback equalizer adapted to receive data from different receive antennas and including a forward filter [[(9)]] and a recursive backward filter [[(12)]] fed with calculated weighted reconstituted data from the output of a decoder [[(13)]] fed by decision means, [[(11)]] and ~~said device further including~~ means [[(10)]] for subtracting the output of said backward filter [[(12)]] from the output data of the forward filter [[(9)]], ~~whereby~~ <u>wherein</u> the subtracted data is fed to the input of the decision means [[(11)]] with the output of the decoder ~~(13) and~~ <u>, wherein</u> the decision means [[(11)]] produce a statistic which is forwarded to a channel decoder with weighted inputs and outputs, <u>wherein</u> ~~and~~ said decision means [[(11)]] take into account the space noise correlation at the output of the subtraction means ~~(10) and~~ <u>, wherein</u> the decision means [[(11)]] and the decoder [[(13)]] are separated by space-time interleaving at a binary level, ~~which device is characterized in that~~ <u>and wherein</u> the forward filter [[(9)]] and the backward filter [[(12)]] are iteratively adapted to minimize the mean square error at the output of the subtractor [[(10)]].

2. (Currently Amended) <u>The</u> [[A]] device according to claim 1, ~~characterized in that~~ <u>wherein</u> the decision means [[(11)]] at the output of the subtraction means [[(10)]] of the <u>decision feedback</u>

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equalizer are of the space whitening type and followed by a sphere decoder.

3. (Currently Amended) The [[A]] device according to claim 1, ~~characterized in that~~ wherein the decision means [[(11)]] at the output of the subtraction means [[(10)]] of the decision feedback equalizer are of the serial and/or parallel type Serial Interference Cancellation/ Parallel Interference Cancellation (SIC/PIC) adapted to cancel residual space interference at the output of the Subtraction means [[(10)]] of the decision feedback equalizer.

4. (Currently Amended) The [[A]] device according to claim 1, ~~characterized in that~~ wherein the space whitening is effected at the output of the subtraction means [[(10)]] of the decision feedback equalizer.

5. (Currently Amended) The [[A]] device according to claim 4, ~~characterized in that~~ wherein the space whitening is effected by the decision means [[(11)]].

6. (Currently Amended) The [[A]] device according to claim 2, ~~characterized in that~~ wherein the space whitening is effected by the forward filter [[(9)]] and the backward filter [[(12)]].

7. (Currently Amended) The [[A]] device according to claim 1, ~~characterized in that~~ wherein, starting from a certain iteration, the forward filter [[(9)]] is an adapted filter.

8. (Currently Amended) The [[A]] system for high bit rate communication over frequency-selective channels with multiple transmit and receive antennas, ~~characterized in that it includes~~

comprising a receiver that includes an equalization and decoding device according to claim 1.

9. (Currently Amended) The [[A]] system according to claim 8 [[7]], ~~characterized in that it includes~~ comprising transmitter means of the Space-Time Bit-Interleaved Coded Modulation (ST-BICM) type.

10. (Cancelled)

11. (Currently Amended) The [[A]] method according to claim ~~10, characterized in that the~~ 16, wherein recursive filtering of the decision feedback ~~equalization~~ equalizing step is also adapted iteratively to minimize the mean square error ~~at the input of~~ inputted to the decision feedback equalizing step ~~equalizer~~.

12. (Currently Amended) The [[A]] method according to claim 16[[9]], further comprising:
    a step of whitening said error obtained as the output from said subtracting step ~~characterized in that the subtracted data is subjected to space whitening~~.

13. (Currently Amended) The [[A]] method according to claim 16[[9]], wherein said detecting step implements a sphere decoding algorithm ~~characterized in that the decision algorithm (11) is of the sphere decoder type~~.

14. (Currently Amended) The [[A]] method according to claim 16[[11]], wherein in said step of filtering said received data by the forward filter, starting from a certain iteration, the forward

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filter is an adapted filter~~characterized in that the subtracted data is subjected to space whitening and the space whitening is effected by the decision algorithm (11)~~.

15. (Canceled)

16. (New) An iterative equalization and decoding method for high bit rate communications over frequency-selective channels with multiple transmit and receive antennas, comprising:

a step of decision feedback equalizing of data received from the receive antennas; and

a step of decoding with the aid of a channel decoder with weighted inputs and outputs, wherein said decision feedback equalizing step comprises:

a step of filtering said received data by a forward filter;

a step of filtering a weighted reconstruction of the data calculated on the basis of the output of said decoder by a backward filter;

a step of subtracting the output of said backward filter from the data at the output of said forward filter; and

a step of detecting applied to the data obtained following the subtracting step and to the data at the output of said decoder, said detecting step taking into account spatial correlation of an error of said decision feedback equalizing step obtained as output from said subtracting step and generating probabilistic information transmitted to the channel decoder after a step of spatio-temporal interleaving at a binary level,

wherein the forward and backward filters are configured in an iterative manner to minimize a mean square error obtained following the subtracting step.